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November 26, 1955

VOL. 68, NO. 22 PAGES 337-352

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Converging Jet Trails

See Page 341

A SCIENCE SERVICE PUBLICATION

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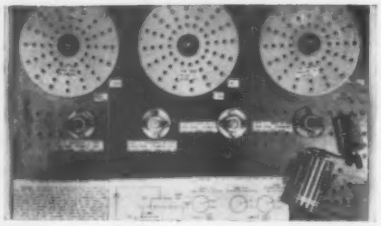

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MEDICINE

Blood Test for Cancer

Simple test, depending on thickening of blood serum of cancer patients but not in persons without cancer, may prove to be long-sought method for mass detection of the dread killer.

➤ A NEW and simple blood test to detect unsuspected cancer is now being evaluated by the National Cancer Institute at Bethesda, Md.

It may prove to be the long-sought test for mass detection of cancer that could be used as chest X-rays are for detecting tuberculosis in the population.

Cancer Institute scientists, however, have not yet gotten far enough with their evaluation procedure to be able to tell whether the new test will be that good or whether it will suffer the fate of other proposed cancer tests that have failed in the rigorous evaluation.

The test depends on a thickening of blood serum found in cancer patients but not in persons without cancer. Discovery of this difference was made by Drs. James A. Quinn and Arthur E. Rappoport and bacteriologist Stanley A. Katz of the Youngstown (Ohio) Hospital Association.

The "distinct differences" in the blood serum of cancer and non-cancer patients can be easily measured by optical methods. The Youngstown scientists used an instrument called the Coleman Jr. spectrophotometer for measuring the optical density of the blood serum, but they believe other similar instruments could be used.

In a study of over 1,700 cases, the new test was at least 90% accurate, the scientists state in the *American Journal of Clinical Pathology* (Oct.).

Negative reactions, meaning no cancer, were obtained in 466, or 97.7% of 479 normal persons. Negative results were also obtained in 817, or 86.3%, of 944 non-cancerous patients sick with other diseases. False positive results came chiefly in persons with acute and chronic inflammations and in pregnancy.

In 313 patients with proved cancer, the test gave true positive results in 282, or 90.1%, of them.

Since the tests on these groups, the Youngstown scientists have made the test on another 3,500 persons, with results that are continuing to be "consistent and encouraging."

Besides picking up early cancer and the hidden and obscure types that often are not detected in routine medical examinations, the test may be valuable for telling surgeons whether a cancer has been completely removed or whether a bit has been left and continued to grow and spread.

The scientists were surprised to find that the test gave best results in cases of early cancer. If cases of advanced cancer were eliminated from those on whom the test was tried, the test would have an accuracy of 96.5%.

Why the blood serum should have a different density in cancer patients is not known. Further study on this, the scientists say, is needed.

Science News Letter, November 26, 1955

ASTRONOMY

Earth Satellite Makes Space the Slave of Man

➤ EARTH'S FIRST artificial satellite, along with artificial nuclear fission, are the "greatest achievements of man's conquest over nature," Dr. Fred L. Whipple, director of the Smithsonian Astrophysical Observatory, with headquarters in Cambridge, Mass., has informed astronomers.

Space will now become the slave of man, as matter and energy are already, he predicted. Just what can be learned from the continued observations from above the earth's atmosphere cannot be foreseen, Dr. Whipple said.

Both professional and amateur astronomers, he told members of the American Astronomical Society meeting in Troy, N. Y., will be able to make direct observations of the satellite as it spins around the earth.

The man-made satellite will probably be launched from within the United States, and will pass over many already established observatories, Dr. Whipple said. Nevertheless, the object will be moving so fast it will be difficult to catch with usual photographic equipment.

Dr. Whipple calculates the satellite will be near the limit of naked eye visibility, but "easily observable" under ideal circumstances with binoculars.

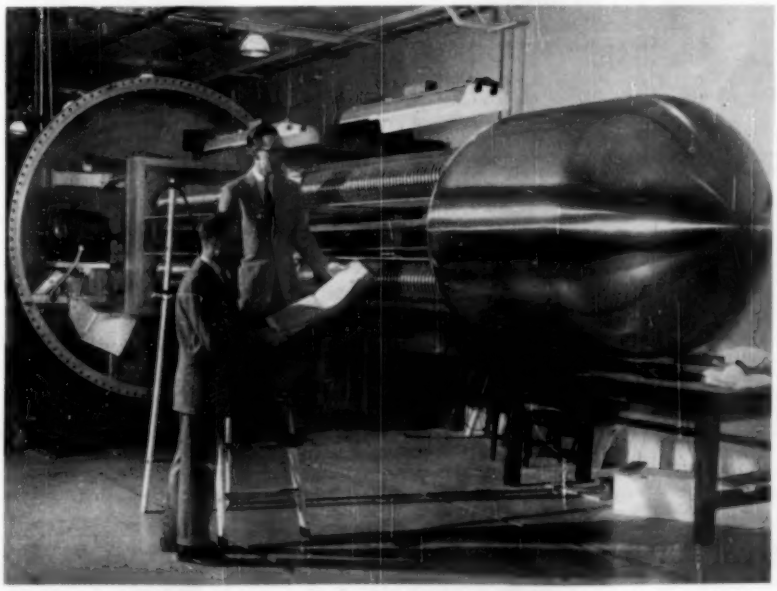
Special devices may be needed for following its motion, since it will be moving about one degree every second. Time determinations, he said, will also have to be exceedingly accurate.

The first problem to be solved with the satellite is to find the density of the earth's high atmosphere by measuring the changes in the object's orbit due to resistance. Reasonably good observations, Dr. Whipple pointed out, would give very precise results, much better than those made from rockets.

Geometrical observations of the satellite will yield extremely good determination of the earth's shape, including positions known to within ten feet.

Measurements likely to be made from the satellite, Dr. Whipple said, would include those of cosmic rays and high energy particles; solar radiation; micrometeors; the earth's magnetic field, and hydrogen in interstellar space.

Science News Letter, November 26, 1955



ELECTRON ATOM SMASHER — An unusual do-it-yourself project is underway on the University of Notre Dame campus where scientists are building a new 4,000,000-volt atom smasher to study the interaction of electrons with matter. Dr. Bernard Waldman, on the left, director of the nuclear physics project at Notre Dame, and Dr. Walter Miller check progress on the electrostatic generator, expected to be completed in early 1956.

SCIENTIA INTERNATIONAL

NOVAS DEL MENSE IN INTERLINGUA

➤ **Virologia.**—Le svnthese laboratorial de un virus active e capace a auto-duplicar se ha essite complite per Drs. H. L. Fraenkel-Conrat e R. Williams del Universitate California. Le componentes usate esseva proteina e acido nucleic, ambes obtenite per le decomposition del virus in question sed ambes demonstratemente inactive. Il se tractava del virus de mosaico de tabaco. Sed post iste successo epochal on pote previder le possibilitate futur de reconstituer le structura chimic de viruses pathogene human de maniera a render los innocue sin cambiar lor effecto de provocar le formation de anticorpores o etiam le possibilitate de construer chimicamente fragmentos de viruses que non es pathogene sed que provoca immunitate a lor forma complete.

➤ **Alimentos.**—Pro proteger fructos e vegetales contra le deteriorante effectos del bassissime temperaturas incontrate durante le aerotransporto a remote stationes de observation in le arctica, le statounitese fortia aeree se servi de un nove pacchettage, consistente de duo inveloppes separate per aqua. Durante le gelation del aqua, le temperatura interior del pacco non pote descender infra O C. Le methodo ha un efficacia de circa 6 horas.

➤ **Ornithologia.**—Le species occidental e orientai del sturnellas statounitese ha distincte (ben que equalmente belle) cantos. Dr. W. E. Lanyon del Universitate Arizona, investigante iste facto, ha constatate que juvene sturnellas, quando isolate ab lor proprie specie, apprende le canto del specie de sturnella in lor nove ambiente. Le minus melodiose "critos" del sturnellas es apparentemente minus influentiabile per le ambiente. Dr. Lanyon signala que su discoperta rende dubitose le previe conception que sturnellas naturalmente capace a producer duo differente cantos debe esser hybridas.

➤ **Expositiones.**—Durante le recente tumultos accompaniante le cadita de Peron in Argentina, duo viagiante expositiones de UNESCO, monstrante nove materiales e apparaturas de energia atomic, esseva demolite e debe esser remontate.

➤ **Entomologia.**—In junio il esseva reportate que Dr. M. Renner de Munich habeva transportate plure colonias de apes ab Paris a New York pro determinar si lor cyclo diurne de alimentation dependeva del ambiente o de un specie de senso absolute de tempore. A New York le apes continuava lor cyclo de Paris sin cambiamento sub le influentia del differente tempore local. Le retrotransporto del apes a Paris ha confirmate le resultatos del prime experimento. Le remanente question, que Dr. Renner spera resolver in experimentos futur, es si le apes heredita lor senso de tempore o acquire lo in lor infantia ab lor co-apes adulte.

➤ **Chirurgia.**—In un par de mascule geminos identic de 24 annos de etate un gruppo de chirurgos de Chicago ha succedite a transplantar un ren ab un individuo al altere. Le fratre recipiente le ren se trova in bon stato de sanitate 9 menses post le operation, e il pare que su vita es definitivemente salvate. In pares de individuos non geminos identic tal transplantas ha nunquam perdurate 5 e ½ menses.

➤ **Seismologia.**—Le fallia San Andreas in California e Mexico ha monstrate in recente annos un movimento horizontal de inter 2 e 5 cm per anno. On crede que isto debe ultimemente esser sequite per correspondente movimentos vertical. Le recente tremores de terra in le region de San Francisco supporta iste conception, sed on time que le proxime futuro va vider un repetition del terribile tremor de terra que in 1906 causava le destruction de San Francisco.

➤ **Criminologia.**—Dr. C. Sannie de Paris reporta inter altere avantiamentos in le scientia del detection de crimines le utilisation de methodos de physica atomic in le demonstration de invenenamento a arsenico. Viste que arsenico exponite al neutrones producite in un pila atomic deveni radioactive, e viste que arsenico in le corpore se concentra in capillos e ungulas, un invenenamento a arsenico pote esser demonstrate simplemente per medio de un contator Geiger. Le precise loco del arsenico in le capillos e ungulas permitte in plus le exacte datation del invenenamento, proque on cognosce le rapiditate del crescentia de iste substantias.

➤ **Agronomia.**—Le lucta contra conilios, organisate in Australia e Anglaterra per medio del morbo viral myxomatosis, pare voler terminar se in un victoria del conilios. Le virus usate disveloppa de plus in plus inefficace stirpes, e on ha ration de timer que quando stirpes inefficace e stirpes efficace entra in concurrentia directe, il es le inefficaces que reimplacia le efficaces.

➤ **Physica Atomica.**—On sape que electrones e positrones es partenarios identic excepte in lor cargas que es opposite e explica le transformation de ambes in energia quando lor massas collide. Correspondentemente on ha cercate un partenario a carga negative pro le proton, con le expectation que le collision del duo resultarea similemente in le transformation de lor massas in energia. Iste entitate "antiprotonic," que de vero ha recipite le nomine de antiproton, esseva demonstrate como vermente existente in plure studios del radios cosmic depost 1951, sed demonstrationes de su existentia terrestre o del possibilitate de crear lo in laboratorios terrestre, ben que repetitemente annunciate, ha usque nunc remanite dubitose. Tamen il pare que le antiproton ha final- e definitivemente essite create in le bevatron del Universitate California per Drs. O. Chamberlain, E. Segre, C. Wiegand, e T. Ypsilantis.

➤ **Agronomia.**—Per fortiar un barra magnetic de circa 5 per 2 cm de largor a descender con le alimento a in le stomacho de juvene vaccas, le veterinario Dr. R. E. Carroll de California ha reducite a quasi zero le procentage de casos de gastritis causate in le stomachos de vaccas per le inglutimento accidental de clavos e altere pecias de metallo.

➤ **Phytochimia.**—Le alcaloides de origine vegetal—includente tanto importantissime substantias como per exemplo morphina, atropina, strychnina, e nicotina—va esser investigate per Dr. E. Leete del Universitate California ab le usque nunc totalmente negligite puncto de vista de lor rolo in le economia chimic del plantas per que illos es producite. Que, per exemplo, es le importantia de nicotina non pro nos fumatores sed pro le planta de tabaco que produce lo in su radices? Quando on graffa un planta de tabaco sin radices super un planta de tomato, le tabaco prospera sin producer nicotina, sed on trova difficile supponer que le production de nicotina in le radices del tabaco es completemente disproviste de signification organico-functional pro le planta mesme.

SCIENTIA INTERNATIONAL appears monthly. Send this page to non-English-speaking friends.

Science News Letter, November 26, 1955

MEDICINE

X-Rays Show Seven Diseases of Subtropics

➤ AT LEAST SEVEN conditions or diseases peculiar to subtropical climates appear in X-ray studies, Dr. Gerard Raap of Miami, Fla., reported at the meeting of the Southern Medical Association in Houston, Tex.

Among the seven included, besides such relatively well-known ones as malaria, amebiasis, leprosy and screw worm infestation, is one known as ainhum, which is a linear constriction of a toe, especially, a little toe.

Science News Letter, November 26, 1955

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PALEONTOLOGY

Scientists Hunt Missing Link

➤ SCIENTISTS are on the trail of one of the most important "missing links" in evolution, the creatures that first emerged from water to give rise to land animals.

Dr. Alfred S. Romer, director of Harvard's Museum of Comparative Zoology, told the American Philosophical Society meeting in Philadelphia it is certain that a member of the fringe-finned fish group *Crossopterygii*, is the ancestral source of land animals.

All members of the fringe-finned fishes were long believed extinct. In recent years, several members of the group, the coelacanths, have turned up alive in African waters. While these coelacanths are not in direct line with the ancestry of land animals, a study of their structure is expected to give new insight into the nature of the real forefathers of land creatures.

The first stages in the migration from sea to land took place before the end of the Devonian period, some 300,000,000 years ago, Dr. Romer said.

None of the living amphibians or reptiles, such as frogs, salamanders, snakes or turtles, Dr. Romer said, is at all similar to the ancient forms that emerged from the water. Rocks from the Permian period, some 2,000,000 years ago, have yielded reptile and amphibian skeletons much more primitive than those of any living forms.

Current studies by Scandinavian scientists on very late Devonian deposits in Greenland have revealed ancestral amphibians truly transitional in many regards between fish and higher animals, Dr. Romer said.

Science News Letter, November 26, 1955

MEDICINE

Use Reserpine for Blood Pressure Emergencies

➤ IN HIGH BLOOD PRESSURE "emergencies," when reducing the blood pressure quickly to safe levels is important, the medicine from an East Indian plant root is the one to use, in the opinion of Dr. John H. Moyer of Houston, Tex.

The plant root medicine is reserpine.

Dr. Moyer used it in three groups of patients with high blood pressure emergencies: 1. malignant high blood pressure; 2. eclampsia, a dangerous high blood pressure condition in pregnant women; 3. the acute kidney condition associated with high blood pressure and called glomerular nephritis.

All patients showed a significant lowering of blood pressure, Dr. Moyer reported at the meeting of the Southern Medical Association in Houston.

The greatest reduction in blood pressure when the patients were lying down brought the pressure to the normal range in the majority of patients.

Science News Letter, November 26, 1955

MEDICINE

Nerve Sheaths Spiral

➤ THE PROTECTIVE SHEATH of certain nerves wraps around the nerve in a spiral, much as insulating tape is wound around electric wire, Dr. Betty Ben Geren of Harvard Medical School and Children's Medical Center, Boston, announced at the sixth annual convention of United Cerebral Palsy in Boston.

Her discovery is considered a "major scientific breakthrough" on problems related to such diseases as cerebral palsy and multiple sclerosis.

Dr. Geren herself explained that the finding gives understanding of the nerve cell's organization. She said such understanding is "fundamental to our eventual knowledge of any disease process involving the central and peripheral nervous system." The central nervous system is made up of the brain and spinal cord. The peripheral nerves are those near the surface of the body.

Dr. Geren's finding was made from study of peripheral nerves. The observations were made largely with the aid of an electron microscope, which magnifies objects up to 20,000 times their original size, and also with polaroid light and X-ray diffraction.

They were made on embryos of chicks, mice and, to a limited degree, on human specimens. Dr. Geren is convinced that the process observed in the chicks and mice operates in the same way in humans.

Specifically, she has been studying the formation of the myelin sheath. This fatty substance surrounds nerve fibers much as insulating material protects electric wire. She has found that the myelin sheath of the nerve fibers in the peripheral, although not in the central nervous system, is formed by a wrapping process.

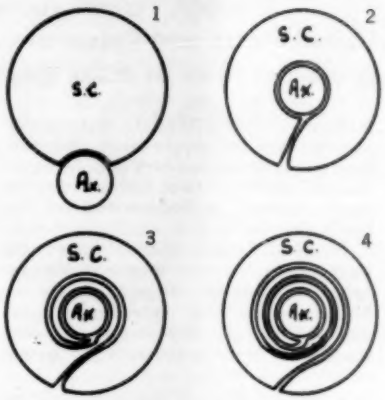
To begin with, the fibers are surrounded by satellite cells named Schwann cells. Dr. Geren has shown that these Schwann cells encircle the nerve fibers and then are wrapped around them in repeated spiraling layers, thus forming the myelin sheath.

During the formation of this spiraling pattern, the outer layer of the nerve fiber is surrounded by the inner edge of the Schwann cell. Thus a double-edged membrane is formed. The older the embryo grows, the more layers are formed.

"One of the problems fundamental to our understanding of neurological disorders," she said, "both in the central and in the peripheral nervous system, concerns the way in which the myelin sheaths are maintained normally or attacked and broken down by specific agents of disease.

"Certain diseases destroy central nervous system myelin sheaths and thus damage nerve function, while others destroy peripheral nerve myelin. We are now trying to discover how the myelin sheaths in the brain are formed, where there are no Schwann cells."

Science News Letter, November 26, 1955



NERVE FIBER SHEATH — This diagram shows how the protective sheath of certain nerve fibers is formed in a spiral pattern. Originally (1), the Schwann cell (S.C.) lies outside the axon, or nerve fiber (Ax), and then (2) it envelops the fiber. Next (3), the spiraling movement starts, and the Schwann cell surface is pulled in to form a double edged membrane. The myelin formation (4), consisting of several layers, is well under way.

AERONAUTICS

Jet Bomber Leaves Converging Sky Trail

See Front Cover

➤ BRITAIN'S LATEST four-jet bomber, the Handley Page Victor, is now in production for the Royal Air Force.

It has a loaded cruising speed of over 700 miles per hour at altitudes of about 60,000 feet. The Victor marks its path across the sky by jet trails that seem to converge in the distance, as shown on the cover of this week's SCIENCE NEWS LETTER.

The convergence is actually an optical illusion, the same that makes railway tracks seem to go closer together in the distance.

Science News Letter, November 26, 1955

INVENTION

Game to Teach Oil Business Given Patent

➤ NOW EVERYONE can be an oil millionaire, at least on paper. A game designed to teach all about the oil business received a patent, No. 2,723,857. Patent rights were assigned to E. I. du Pont de Nemours and Company of Wilmington, Del.

Science News Letter, November 26, 1955

GENERAL SCIENCE

Soviet Science Manpower

Although comparisons of educational systems in United States and Russia are difficult, a study shows U.S.S.R. graduates twice as many specialists as the U. S. in some fields.

➤ A DEFINITIVE STUDY of the education, training and supply of Russian professional manpower has been released by the National Science Foundation and the National Academy of Sciences-National Research Council.

The study shows that, although the United States has more than two and one-half times as many college graduates, the Russian concentration on educating scientists has closed the gap or even surpassed this country in the total number of trained scientists.

Published in book form (see p. 348), the study was reported by Nicholas De Witt of the Harvard University Russian Research Center.

Dr. Alan T. Waterman, director of the Foundation, and Dr. Detlev W. Bronk, president of the Academy, said the book was issued in the hope it will "focus nationwide attention on the capabilities of other nations in science and technology," and to arouse interest in the United States for the need to groom our own future professionals in these fields.

Mr. De Witt points out that there is a basic difference in the educational philosophies of the United States and Russia. In this country, he explains, the ideal is to educate as many of its citizens as possible for their own as well as for the public welfare.

In a totalitarian state the goal is to serve the needs of an expanding industrial order and the complexities of a bureaucratic government.

The author cautions his readers that literal comparisons of the two educational systems are not possible because of the philosophy of education differences.

Despite these differences, however, Mr. De Witt has incorporated some significant facts on the Soviet scientific manpower picture.

Some of these are:

1. The Soviet Union is graduating almost twice as many technical specialists in some fields as is the U. S.

2. The Soviet Union operates on a more limited educational base than does this country, graduating only a small number of students in the humanities.

3. The Russians achieve their high ratio of professionals in the labor force (about 47 per 1,000 workers) by starting them off early in secondary school, giving them incentives and differential treatment.

4. Soviet young people, once committed to a career, cannot change their minds.

5. In spite of the fact there were more than 5,500,000 Americans with higher education in 1953 as opposed to 2,000,000 Russians, in applied scientific fields, the number is equal or somewhat more favorable to the Russians.

6. In Russia, more than 60% of the regular graduates are science majors. Thirty-one percent of the 1954 graduates were engineers as opposed to eight percent of the total in the U. S.

Science News Letter, November 26, 1955

MEDICINE

Develop "Ouch Meter" To Test Pain-Killing Drugs

➤ DEVELOPMENT OF an "Ouch Meter" to test pain-killing drugs has been announced by the Upjohn Company, Kalamazoo, Mich.

The ouch meter tests the drugs by giving a heat stimulus to a rat after the animal has been given one of the drugs. The instant the rat moves its tail in response to feeling the heat, a photoelectric cell automatically stops the timer on the ouch meter.

The effectiveness of various analgesics, or pain-killers, is determined by comparing reaction times of a large number of rats following various doses of each analgesic.

Science News Letter, November 26, 1955

GEOPHYSICS

Global TV Possible Now

➤ TELEVISION RELAY STATIONS linking America and Europe are possible "today," Dr. Allen B. DuMont, president of Allen B. DuMont Laboratories, said in Washington.

He urged an immediate start on live transoceanic television in an address at George Washington University, sponsored by sections of the Institute of Radio Engineers and the University.

New techniques make the long-distance television possible now, he said, and suggested Congress study the benefits in "global understanding" to be gained from such intercontinental hook-ups.

Dr. DuMont outlined the commercial applications of communications by "scatter" methods, which give point-to-point radio links over long distances often more reliably than presently used methods.

The new kind of radio propagation at very high frequencies over long distance also has important military applications, particularly in the Arctic and Antarctic where communications are often disturbed by auroras and magnetic storms.

Communications by the new techniques were the subject of a two-day symposium, the first of its kind.

Picking up "scattered" radio waves can be likened to "seeing," from hundreds of miles away, a powerful searchlight beamed into the air. The light beam actually goes off into space, but impurities in the air—dust, pollen, etc.—scatter a very small part of the light. If the exact spot to look for this scattered light is known, it can be seen by someone 100 miles away with a telescope.

Similarly, most of the radio frequency power generated in the new method is lost in space, but some of it is scattered by electrically charged layers in the lower parts of the earth's atmosphere. This portion is received hundreds of miles away by high gain antennas aimed at the right spot.

The "scatter" method has been used for nearly two years by U.S. armed forces on four short-wave communication channels operating from Goose Bay, Labrador, to Sondrestrom, near the center of Greenland, and from there to the far northern base of Thule.

Results (see SNL, May 29, p. 339) show the propagation method to be over 99% reliable under most conditions.

Other results of wide use of "scatter" methods include possible cost reduction on radio-telephone calls to Europe, and long-distance remote control of industrial operations.

The discovery has extended the useful radio spectrum considerably, and just how much was one of the subjects discussed by scientists at the symposium.

Science News Letter, November 26, 1955

ANTHROPOLOGY

Pottery Maker Added To Style of Monuments

➤ THE INDIVIDUAL INDIAN sitting at his campfire decorating the family pottery contributed much to the monumental art styles of the massive temples of early Central America, Dr. Tatiana Proskouriakoff of the Carnegie Institution of Washington told the American Anthropological Association meeting in Boston.

Most notable contribution of folk arts to classic styles in early Middle America was that of the scroll design, she said. The scroll design dominated ornamental design.

By study of the popular designs on the pottery unearthed by archaeologists, she pointed out, it is possible to learn much of the development and waning of cultures and of contacts between different people.

The scroll design was particularly popular in the Maya area and in central Veracruz at about 300 A.D. It can be traced back, however, as far as the Miraflores Phase, about 500 B.C., in Highland Guatemala. The scroll persisted until the culture waned in 1,000 A.D.

Science News Letter, November 26, 1955

HELICOPTER ON SUBMARINE—This photograph was made when a Marine transport helicopter, the HRS-1, landed aboard the submarine USS Sea Lion during recent training maneuvers off the North Carolina coast. This was one of the few times aircraft of any kind has landed aboard a submarine.

CHEMISTRY

Pure Heavy Nitrogen

➤ RARE HEAVY NITROGEN, isotope 15, has been produced in 99.8% purity.

This promises to provide a new, simpler way of extracting from atomic breeders the kind of fissionable (useful for atomic bombs and power) uranium made from relatively plentiful thorium.

Announced by Columbia University, the new concentration of nitrogen 15 was accomplished by Prof. T. Ivan Taylor and Dr. William Spindel of Columbia's chemistry department, who used two thin parallel glass columns, each 18 feet high, in which the rare isotope is transferred from nitric oxide gas to nitric acid.

By multiplying this many times, the concentration of nitrogen 15 was raised from less than 0.4% in nature to more than 99.8%, with commercial costs of less than $500 a pound probable. The highest concentration of nitrogen 15 heretofore, 60%, sold for $175,000 per pound.

At present only a small bottle of the isotope exists in the high purity.

The heavy nitrogen would be used in atomic reactors for breeding uranium 233 from thorium, since nitrogen 15 absorbs or wastes very few of the neutrons that do the breeding conversion compared with ordinary nitrogen 14.

The thorium in the form of its nitrate is bombarded by neutrons from the core of an atomic furnace. One hitch in using the process results from radiation damage causing the evolution of nitrogen gas from the nitrate.

This makes it troublesome to recombine into nitric acid and finally into more thorium nitrate, but it is hoped that the difficulty can be overcome.

Breeding atomic fuel from thorium will allow production of more atomic fuel than is available from uranium alone.

Nitrogen 15 will be used immediately for studies upon the constitution of the nitrogen nucleus or heart. Bombardments in the new AEC-supported 6,000,000 electron volt Van de Graaff accelerator at Columbia will determine energy levels in the atoms of the two kinds of nitrogen.

The heavier nitrogen will also find use in studies of photosynthesis and other biological and medical reactors involving nitrogen. The weight 15 variety can be distinguished from the common sort by use of the mass spectrometer. It is not radioactive like carbon 14 and cannot be traced that way.

Science News Letter, November 26, 1955

Automatic typewriters record temperatures in huge *nuclear reactors* producing plutonium.

GENERAL SCIENCE

Spies Are Not Needed For Scientific Intelligence

➤ NO SPIES need apply for jobs in scientific intelligence, if the advice of Dr. Samuel A. Goudsmit given to the American Philosophical Society meeting in Philadelphia is followed.

Dr. Goudsmit, now chairman of the physics department at Brookhaven National Laboratory, investigated why the Germans did not achieve the atomic bomb during World War II.

"There are no Mata Haris with doctors' degrees in physics or chemistry," Dr. Goudsmit said. "Scientific knowledge cannot be transmitted via laymen.

"The purpose of scientific intelligence is to estimate whether a country's scientists and laboratories will make a significant contribution in case of a war emergency. Such an evaluation requires an insight not merely in science but also in economic, political and historical questions. It can be achieved only through the cooperation of many competent specialists. The sources of information are usually openly available but visible only to those who are aware of the intelligence problems.

"The evaluation of technical and scientific progress is rather straightforward. More difficult and at least equally important is to reach an opinion about the mutual influence between scientists and governments.

"Under Hitler and Peron and from time to time in the U.S.S.R., pseudo-scientists were the principal advisers to the authorities, which of course had detrimental effects upon progress."

Science News Letter, November 26, 1955

PUBLIC SAFETY

Gas Gangrene Toxoid For Atomic Casualties

➤ A TOXOID for immunizing people against gas gangrene is now being developed at the University of Cincinnati, Col. Herbert W. Coone, Air Force Medical Corps and chief of professional services at the USAF Hospital, Wright-Patterson Air Force Base, Ohio, revealed at the meeting of the Association of Military Surgeons of the United States in Washington.

Such a toxoid, he pointed out, would be the "major hope" for suppressing or preventing gas gangrene infections among the mass casualties of atomic warfare.

Even in Korea, such infections were more prevalent than previously believed likely. This was partly due to inexperience with the infections and consequent inability to recognize them on the part of otherwise highly skilled surgeons.

Under conditions of shock and delayed debridement of wounds which occur in mass casualties, antibiotics may be less effective than gas gangrene toxoid immunization for stopping this serious wound infection.

Science News Letter, November 26, 1955

PHYSIOLOGY

Landy Takes in More Oxygen than Most People

➤ JOHN LANDY, the Australian miler who holds the world's record for that distance, takes in more oxygen when he is running than does the normal person.

This ability to take in more oxygen is probably a factor that distinguishes champions from everyone else in endurance events, Dr. P. O. Astrand of the Kungliga Gymnastiska Centralinstitutet in Stockholm reports in *Nature* (Nov. 12).

Tests with Landy, two other middle-distance runners, the Swedish national ski-team and 86 well-trained male and female students showed the difference in oxygen capacity. Landy had the highest value for oxygen intake for all those tested. The other athletes' intake was also significantly higher than that of the students.

Values for other reactions tested, such as maximum heart rate and pulmonary ventilation, were about equal for all the males tested, Dr. Astrand reports.

"The most striking difference between the students and the middle-distance runners and skiers," he states, "is found when comparing the capacity for oxygen intake."

This capacity, he concludes, is an essential characteristic of people with a high standard of physical fitness in events of endurance.

Science News Letter, November 26, 1955

BIOLOGY

Iron Curtain Mystery Animal Not Mysterious

➤ SCIENTIFIC EYEBROWS, raised archly after a recent report of the "discovery of a new phylum of animals" in Russian seas, can be lowered.

It was all a mix-up of words, a scientist reports in *Nature* (Nov. 5). The Russians have found several specimens of a very rare deep-sea creature, Pogonophora, which was already known to scientists. What they did was to reclassify the worm-like animal, moving it from a lower-group into a phylum all its own.

A phylum is the largest classification of creatures below the initial division of plants or animals. The Russian move places the Pogonophora on equal rank with such major phyla of animals as the vertebrates, sponges and mollusks.

When news of the "discovery of a new phylum" appeared via London, Smithsonian Institution scientists were queried. Puzzled by the reported "new discovery," they said it was an extremely rare creature thought to show characteristics of both backboneless and backboned animals, and the Russians had worked on it for several years.

Dr. Gavin de Beer of the British Museum (Natural History), cleared up the mystery in *Nature*, stating the news dispatch "was, of course, a mistake." The papers of the Russian scientist, A. V. Ivanov, on the Pogonophora made generous acknowledgment to all previous workers on this group, he reports.

"The animals have been known for some time, but Prof. Ivanov has created a new phylum for them, and this may have caused the misunderstanding," Dr. de Beer notes.

Pogonophora, which are found in the deep sea, are elongated tube-like animals whose body is composed of a short front portion bearing tentacles, and a very long trunk. A nerve center is present, but no trace has yet been found of gut, mouth or anus. How they feed is a mystery.

Chief interest of the Pogonophora to scientists is that they may offer clues to the evolution of animals with backbones from backboneless creatures.

According to Dr. de Beer, the Russian scientist Vavilov believes the Pogonophora to be related to another group of transitional animals that include the acorn worm, *Balanoglossus*, and the sea squirts, *Tunicata*.

Science News Letter, November 26, 1955

PSYCHOLOGY

Summarizes TV's Impact On American Society

➤ TELEVISION has brought the family back together and, at the same time, disrupted the mealtimes and bedtimes of the nation's children.

These are some of the ways television has affected American society, Thomas E. Coffin, research manager of the National Broadcasting Company, reports.

Summarizing the many studies made by scientists since 1948, Mr. Coffin states that, although a definitive study of television's impact remains to be done, there has been enough solid research to get a clear picture of the impact to date.

Mr. Coffin reports that television will play a much more important role in 1956 political campaigning than it did in 1952. For one reason, there are now more TV sets in the United States; an estimated 35,000,000 this year, or as many as cars or telephones owned by families.

The TV home is described as of relatively high income and occupational status, large family size and moderate education.

The TV set itself is on five hours of the day in the average home, where it has seriously cut radio listening. Magazine and book reading, Mr. Coffin found, is more affected than is newspaper reading.

The advent of television in the American home brought the family back together, and keeps it together, he reports in *The American Psychologist* (Oct.), but in a "passive," rather than "active" way.

"Within the home," he states, "meals, bedtimes and hobbies may suffer interference."

This is true for children, as well as for adults, about whom scientists have found that TV disrupts their mealtimes and bedtimes, but not their school progress.

Although TV has been under fire for the crime and violence in programs, Mr. Coffin states: "parents see many more advantages than disadvantages" in it for children.

Science News Letter, November 26, 1955

IN SCIEN

GENERAL SCIENCE

Soviet Atoms Papers Available in English

➤ FOR $350 anyone can have the complete proceedings of the pre-Geneva Atoms-for-Peace Conference convened by the Soviet Academy of Sciences last July.

A translating bureau in New York is about to issue 87 reports, ranging from reactor technology to the study of the wear of cutting tools, in English and in five volumes, totaling 1,400 pages.

These papers, which were presented in Russian to many of the delegates attending the Geneva Atoms conference, cannot be purchased in the original Russian in the United States.

The report now in English does not duplicate papers that were presented by the Russians at Geneva.

The proceedings of the conference at Geneva, under the auspices of the United Nations, will appear in four languages, with the English version being issued first. The Geneva Conference reports cost $110 (pre-publication price).

Science News Letter, November 26, 1955

BIOCHEMISTRY

Sees Many Drugs Lost Because Man Not a Mouse

➤ MANY GOOD MOLD REMEDIES may have been thrown down the drain or still be lying unused on laboratory shelves because man, after all, is not a mouse.

The antibiotics would be those that stopped disease germs when tried in the test tube but failed when given to mice sick with the disease. The drugs might, nevertheless, be capable of stopping the disease in humans.

One such mold remedy, or antibiotic, is cycloserine, now showing promise through trials in humans of being a new major weapon against tuberculosis.

When first tried against pneumonia in mice, it was some 300 times less effective than penicillin. Yet on human patients with pneumonia it has been reported giving "dramatic" results.

The cycloserine story should lead to rechecking of hundreds of discarded antibiotics, Drs. Israel G. Epstein and Michael G. Mulinos of New York Medical College stated.

They pointed out that, if mouse and other laboratory animal tests show a new antibiotic to be safely non-toxic and if test tube results show it active against disease germs, it should be tried on humans even if it has been ineffective in curing sick laboratory animals.

Science News Letter, November 26, 1955

CE FIELDS

PUBLIC HEALTH

Give Big Atropine Dose To Nerve Gas Victims

➤ VICTIMS OF NERVE GAS poisoning or of poisoning by related organic phosphate compounds used as insecticides should swiftly be given big doses of atropine, Dr. Archer S. Gordon and Charles W. Frye of the University of Illinois College of Medicine, Chicago, state in the *Journal of the American Medical Association* (Nov. 19).

Their study was made with a grant from the Army Chemical Center Medical Laboratories, Edgewood, Md.

Persons poisoned by the nerve gas and related compounds can stand much larger doses of atropine than doctors generally realize, the report shows.

The first dose should be two milligrams for those with mild or moderate poisoning symptoms. This is three to five times the doses doctors usually give when using atropine for other conditions. In severe poisoning cases, the first dose should be even bigger, four to six milligrams.

After the first dose, more should be given until there are no more signs of poisoning. The reason for this, the report says, is that recovery depends mainly on regeneration of cholinesterase enzyme in the tissues. This enzyme is destroyed by chemicals of the nerve gas type, and the effects of these chemicals are prolonged.

Science News Letter, November 26, 1955

MEDICINE

Virus in Blood Shows Transfusion Danger

➤ DISCOVERY of a hitherto unknown disease virus in human blood points up a new danger in blood transfusions, two former Army Medical Corps scientists warn in the *Journal of the American Medical Association* (Nov. 5).

The two are Dr. Ernest Beutler, now at the University of Chicago's department of medicine and the Argonne Cancer Research Hospital, and Dr. Raymond J. Dern, now at the Stritch School of Medicine, Chicago.

They discovered the new virus while studying the survival of red blood cells. This was part of an Army study of malaria.

An influenza-like feverish illness hit five of six persons getting red blood cells from the same donor. The 'flu-like illness struck within two weeks of the red cell transfusion.

The donor was an apparently healthy 25-year-old man who had been an inmate of the Illinois State Penitentiary the previous four years. Careful examination of this man and study of his health record showed he would have been considered an acceptable blood donor, even by most rigid standards, except for one item in his history. This was the fact that he had used narcotics a few years before, and sometimes used hypodermic needles of other addicts.

The virus in his blood could not be identified as any known virus, but it was still in his blood and still capable of causing disease even when the blood had been stored in the refrigerator in acid-citrate-dextrose solution for two days.

"Routine blood banking practices," the scientists state, "would permit transmission of the agent."

Its discovery might have been missed if it had not been that five of a group of six persons who got this blood all got sick at the same time. Checks of others who had received blood from the same donor during the study showed that many of them also had been sick after the transfusion.

Science News Letter, November 26, 1955

MEDICINE

Need Study of Normal Life to Beat Disease

➤ BASIC RESEARCH in normal life processes is needed to conquer disease. This research, moreover, must be done through all fields of science, including mathematics, genetics and physics as well as chemistry, biology and medicine.

This is the conclusion of the American Foundation's report, "Medical Research: A Midcentury Survey." The report was written by the foundation's member-in-charge, Miss Esther Everett Lape, with the aid of a 26-member committee of consultants.

Mental disease, the report points out, might be conquered by study of the physiology and chemistry of the nervous system and the electrical activity of the brain. There is "no twisted thought without a twisted molecule," the report states.

The antibiotics, so-called mold remedies, "highlight the danger of application that is not oriented by continuing research."

They have accomplished miracles in suppressing infections, but have also raised fundamental biological problems. The fact that disease germs become resistant to one after another of the antibiotics shows that the answer to conquest of disease germs is not the development of more and more antibiotics nor the use of one after another to stop a particular disease.

Only fundamental research such as that into the structure of the penicillin molecule and into the reaction of the germ-infected body will solve the many problems raised by the antibiotics.

Alcoholism is another problem the report says needs more fundamental research. Both Alcoholics Anonymous and antabuse, it states, will go further when contributions from laboratories of biology, physiology, chemistry (brain metabolism) and physics (electrical activity of the brain) are available.

Science News Letter, November 26, 1955

MEDICINE

Blood Test Available for Early Arthritis Diagnosis

➤ DOCTORS all over the country can now have a simple, 90% accurate blood test made to help them determine whether their patients have rheumatoid arthritis.

Especial value of the test is that it detects this form of arthritis in early stages when it is often not readily recognized. In 70% of cases of rheumatoid arthritis, crippling can be prevented if proper treatment is begun early.

Availability of the new test to doctors generally was announced by Dr. Ronald W. Lamont-Havers, associate medical director of the Arthritis and Rheumatism Foundation, New York.

It is the first such arthritis test ever to be released for public use, he said.

The test depends on the fact that sensitized sheep blood cells will clump when in contact with blood from a rheumatoid arthritis patient. This finding was made in 1947 at Columbia Presbyterian Hospital, New York. Scientists still do not know why the sheep cells behave this way.

In the years since then, however, the test has been refined to its present 90% degree of accuracy. The last refinement in the test, made this year, was accomplished by scientists at Yale University and Grace-New Haven Hospital, New Haven, Conn.

This hospital is where doctors all over the country are now invited to send blood serum from their patients suspected of having arthritis. Information on how to send the blood can be obtained from the hospital.

In New York, doctors of the city's 44 arthritis clinics can have the test made at either New York Post Graduate Medical School or at the University Division of Kings County Hospital.

Science News Letter, November 26, 1955

GLACIOLOGY

Greenland Glacier Moving, Expedition Finds

➤ THE GREAT GREENLAND ice cap, situated approximately 40 miles above Thule Air Force Base, is advancing very slowly.

The advance of this glacial area, whose movement is unlike most of the world's glaciers at the present time, was reported by Dr. Richard P. Goldthwait, who headed a nine-man Ohio State University Arctic expedition last summer.

Dr. Goldthwait explained that the advance of the ice edge results from increased snowfall in recent years brought on by warmer weather.

The study, made some 700 miles within the Arctic Circle and about 1,000 miles from the North Pole, was sponsored by the Snow, Ice and Permafrost Research Establishment of the U. S. Army Corps of Engineers. Knowledge of glaciers' behavior is necessary for engineering or military operations in glaciated regions.

Science News Letter, November 26, 1955

ASTRONOMY

Venus Becomes Prominent

Two brighest objects in December skies are the planets Venus and Jupiter. Solar eclipse occurs on Dec. 14 and official beginning of winter comes on Dec. 22.

By JAMES STOKLEY

➤ MOVING RAPIDLY away from the sun, the planet Venus is becoming more and more conspicuous in the evening sky.

During December, particularly toward the end of the month, it will be seen shining brilliantly in the southwestern sky, as dusk is falling.

Of astronomical magnitude minus 3.3, Venus will be so bright it will appear far ahead of any other star or planet, making it easy to identify. An added attraction will be provided on the evening of Dec. 16, when the crescent moon will stand close by.

The accompanying maps show the appearance of the skies at about 10:00 p.m., your own kind of standard time, at the first of December, 9:00 p.m. on the 15th, and 8:00 p.m. as the month comes to a close. Since Venus sets before these hours, it is not shown.

Neither do the maps show the second bright planet of December evenings, which comes up in the east after the time for which they are drawn. This is Jupiter, now in the constellation of Leo, the lion. It rises about 11:00 p.m. at the first of December and 9:00 p.m. at the end.

Jupiter Very Conspicuous

Although only about a quarter as bright as Venus, it is still brighter than any other star or planet. Moreover, the fact that it will be seen against a dark sky, and not in the twilight, will make it very conspicuous.

Of the December evening stars shown on the maps, Sirius, the "dog-star," in Canis Major, the great dog, is the brightest. It is seen in the southeast just below the magnificent constellation of Orion, the warrior.

This familiar group is easily recognized by the row of three stars that form his belt, according to the old pictures that used to be drawn, in imagination, around the stars of the various groups. Betelgeuse, the bright star toward the left and a little higher, marked one shoulder, while Rigel, lower and to the right, was in one of his legs.

Above Orion is Taurus, the bull, containing Aldebaran, another star of the first magnitude, which marks the animal's eye. This is in a V-shaped group of stars called the Hyades.

A little higher—in the bull's shoulder—is an even more famous cluster of faint stars, the Pleiades, often called the seven sisters, although only six can be seen easily with the naked eye. Use a pair of opera glasses or a pair of binoculars to view them, and you will see a great many more.

To the left of Canis Major and a little higher, is Canis Minor, the lesser dog, in which bright Procyon shines. And still higher one comes to Gemini, the twins, whose brightest stars are Castor and Pollux.

Above this group we come to Auriga, the charioteer, with the first magnitude star Capella.

Toward the northwest Cygnus, the swan, is still visible, with the star called Deneb. Although of the first magnitude, its relatively low position in the sky makes it appear somewhat fainter. The same is true of Vega, in Lyra, the lyre, shown just above the northwestern horizon.

Shining overhead on summer evenings, it is the brightest star in the sky. But now its light has to pass through such a greater thickness of atmosphere, because of its low altitude, that it appears of the second magnitude.

Early Morning Planets

As for the other planets, Mars, now of the second magnitude because it is far away from the earth, rises in the southeast a few hours ahead of the sun, in the constellation of Libra, the scales. Saturn, considerably brighter, is in the same group, and comes up about an hour before sunrise. Mercury is too nearly in the same direction as the sun to be seen during December.

Whenever the moon is new, as it is on Dec. 14, it comes almost between the sun and the earth, which means that the lunar shadow is in our direction. Usually the moon is north or south of the exact line between earth and sun, hence its shadow misses the earth. But sometimes the moon is at what is called a "node" at the time it is new, and then it does come directly between the other two bodies.

If this happens, the shadow of the moon is directed toward our planet, and then there is a solar eclipse, which may be total if the shadow reaches all the way.

Because the sun, which supplies the light, is more than a hundred times as big as the moon, the shadow tapers to a point, about 230,000 miles away. Last June 20 this shadow reached well to the earth, producing the longest eclipse of the sun visible in more than a thousand years.

Year's Second Solar Eclipse

The new moon on Dec. 14 brings the year's second solar eclipse, but this time we are farther away from the moon than the length of its shadow. Hence it does not reach us, and the eclipse will be not total, but annular. That is, in the parts of the world toward which the shadow is pointed, the moon will look a little smaller than the sun and, although the moon will pass in front of the sun, the sun will not be completely hidden.

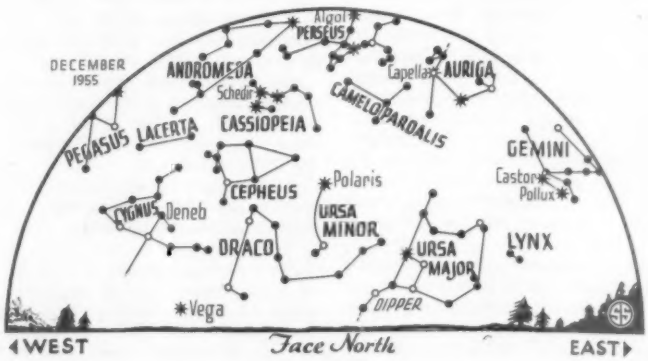
A ring of the sun's surface, called the annulus, the Latin word for "ring," will be visible around the black disc of the moon.

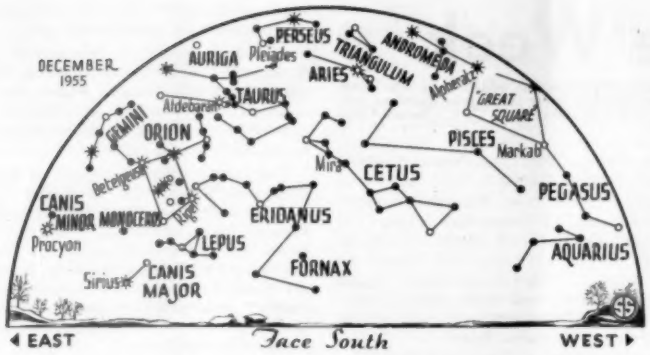
Unfortunately, no part of this eclipse will be visible in North or South America, since it all happens while it is night over here. But the annular phase will be seen along a path crossing the Sudan, the Indian Ocean, Thailand and part of China.

Over all of Africa, except the southern and western parts, most of Asia and the islands to the southeast of it, and southeastern Europe, a partial eclipse will be seen, with the moon passing over the edge of the solar disc.

In the celestial time table at the end of this article, it will be noticed that the full moon on Dec. 28 occurs only a few hours after the moon is at it nearest position for the month, technically called "perigee."

This will produce an effect apparent to people along the coast, in making the high





☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

tides about that date extra high, and the low tides extra low.

Tides are caused by the gravitational attraction of the sun and the moon on the waters of the earth. When all three of these bodies are in line, as they are both at new and full moon, their attraction is exerted together, and then we have what are termed "spring" tides, with a relatively large range between high and low.

At first and last quarter, the moon is at right angles to the sun's direction, and the solar and lunar tides tend to counteract each other, with the high of one filling up the low of the other. These are called "neap" tides.

In addition, the distance of the moon is a factor, for its effect is greater when it is closest. Thus, if its nearest position of the month occurs when it is new or full, there are spring tides of even greater range than normally, and that is what happens this December.

Another important event of December happens on the 22nd at 10:12 a.m., EST. This is the winter solstice, which marks the beginning of winter in the Northern Hemisphere and of summer south of the equator.

At this moment the sun reaches the most southerly position of its annual apparent journey around the sky. Thus, the 22nd is the shortest day of the year. After this the days will get longer and the sun each day will rise a little higher in the sky.

Celestial Time Table for December

Dec.	EST	
4	9:00 a.m.	Mercury behind sun
5	10:04 a.m.	Moon passes Jupiter
6	3:35 a.m.	Moon in last quarter
10	12:35 p.m.	Moon passes Mars
12	early a.m.	Meteors visible radiating from constellation of Gemini
14	2:07 a.m.	New moon, annular eclipse visible in Africa and Asia
15	1:09 a.m.	Algol (variable star in Perseus) at minimum brightness
	2:00 a.m.	Moon farthest, distance 252,600 miles
16	3:03 p.m.	Moon passes Venus
17	9:58 p.m.	Algol at minimum
20	6:48 p.m.	Algol at minimum
22	4:39 a.m.	Moon in first quarter
	10:12 a.m.	Solstice, sun farthest south, winter begins in Northern Hemisphere
23	3:37 p.m.	Algol at minimum
28	7:00 p.m.	Moon nearest, distance 221,500 miles
	10:44 p.m.	Full moon

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, November 26, 1955

INVENTION

Telephone Answering Device Patented

▶ A DEVICE that answers the telephone, informs the caller that the person dialed is out and records a message received patent No. 2,724,015. It is the invention of Harry R. Van Deventer and John J. Shively of New York and Paul C. Bailey of Warminster, Pa., who assigned patent rights to the Telephone Answering and Recording Corporation of New York, N. Y.

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PALEONTOLOGY

Story of High Sierra Told in Fossil Leaves

▶ THE STORY of California's High Sierra can be read in fossil leaves, according to Dr. Daniel I. Axelrod, professor of geology at the University of California at Los Angeles, who has done so.

Some 15,000,000 years ago California's precipitous mountain range was a gentle slope that reached a height of probably no more than 3,000 feet.

Then volcanoes erupted, blanketing the range with several thousand feet of ash. Near the beginning of the Ice Age a series of violent upheavals elevated the range an additional 6,000 to 8,000 feet. And it is still growing.

According to Dr. Axelrod, the distribution of fossil plants from the late Miocene rocks accurately reflects the annual rainfall during this time. It indicates that there was a difference of only about 15 inches of average annual rainfall between the lowlands and the Sierra Nevada of the Miocene epoch. Today there is a difference of fully 60 inches.

Since rainfall shows a certain correlation with altitude, this rainfall pattern of 15,000,000 years ago suggests the range was then no higher than 3,000 feet.

As the mountains were elevated new zones of life were created. Zones of sub-Alpine and Alpine life came into being as did the desert areas of once verdant Nevada. Plants and animals that invaded these new zones were derived chiefly from habitats now marginal to these extreme environments.

Dr. Axelrod's research helped establish approximately when these mountainous zones were created, when evolution could begin to operate in them. His work also helps explain why there is such a diversity of life in the area.

Science News Letter, November 26, 1955

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ALFRED P. SLOAN FOUNDATION REPORT FOR 1953-1954—Alfred P. Sloan, Jr., President—*Sloan Foundation*, 127 p., illus., paper, free upon request direct to publisher, 30 Rockefeller Plaza, New York 20, N. Y. Reporting grants to some 90 educational, medical and other institutions totalling more than $6,500,000.

ALMANAC AND WEATHER FORECASTER—Eric Sloane—*Little, Brown*, 169 p., illus., $3.50. Delightful text and drawings by the author, combining weather folklore, nature observations and the science of weather prediction.

THE AMERICAN MUSEUM OF NATURAL HISTORY ANNUAL REPORT—Albert E. Parr, director—*American Museum of Natural History*, 83 p., paper, free upon request direct to publisher, Central Park West at 79th St., New York 24, N. Y. The report this year includes a historical review of the Museum's work in the geological sciences.

THE ATOM IN OUR HANDS—*Union Carbide and Carbon Corporation*, 40 p., illus., paper, free upon request direct to publisher, Room 308, 30 East 42nd St., New York 17, N. Y. A clear description of how uranium is separated to obtain the rare uranium 235 and also how the atom is put to use peacefully in medicine, industry and agriculture.

AUTOMATION: A New Dimension to Old Problems—George P. Shultz and George B. Baldwin—*Public Affairs Press*, Annals of American Economics, 20 p., paper, $1.00.

CELESTIAL NAVIGATION FOR YACHTSMEN—Mary Blewitt—*Iliffe (Philosophical Library)*, 3d ed., 64 p., illus., $2.75. A simplified book for beginners.

THE CHALLENGE OF AUTOMATION: Papers Delivered at the National Conference on Automation—Joseph O'Mahoney and others—*Public Affairs Press*, 77 p., paper, $2.00.

CHLORPROMAZINE AND MENTAL HEALTH—Henry Brill and others—*Lea & Febiger*, 200 p., illus., $3.00. Discussion at a symposium of effects obtained with the new calming drug, chlorpromazine, now available commercially as thorazine.

CLASSICS OF BIOLOGY—August Pi Suner, authorized English translation by Charles M. Stern—*Philosophical Library*, 337 p., $7.50. For teachers of science and the serious student.

CONSTRUCTIONAL STEELWORK—Oscar Faber—*Philosophical Library*, 368 p., illus., $12.00. Based on the latest British standard regarded as the best by the author, who was consulting engineer in the rebuilding of the Bank of England and the House of Commons.

DESIGNING FOR INDUSTRY: Some Aspects of the Product Designer's Work—F. C. Ashford—*Philosophical Library*, 222 p., illus., $7.50. For the student and those without previous knowledge of the field as well as those already practicing design in industry.

THE ENGINEERING OF CONSENT—Edward L. Bernays, Ed.—*University of Oklahoma Press*, 246 p., $3.75. Telling how to apply scientific findings to the field of public relations.

FISH AND WILDLIFE: The Story of the Work of the U. S. Fish and Wildlife Service—C. B. Colby—*Coward-McCann*, 48 p., illus., $1.25. Beautifully illustrated with official photographs of the Fish and Wildlife Service.

ILLINOIS TREES: Their Diseases—J. Cedric Carter—*Illinois Natural History Survey Division*, Circular 46, 99 p., illus., paper, 25 cents. Information to help you identify tree diseases and an outline of treatment.

INDUSTRY-COLLEGE RELATIONS—Edward Hodnett—*World Publishing Co.*, 158 p., $3.50. Resulting from a conference and survey to determine how industry and institutions of higher education can be mutually helpful.

JET ENGINE MANUAL—E. Mangham and A. Peace—*Philosophical Library*, 133 p., illus., $3.75. Most of the information here applies to the largest proportion of turbo-jet and turbo-propeller engines in current use, although specific details of some of the latest types could not be included owing to security restrictions.

A LABORATORY GUIDE FOR ELEMENTARY PHYSIOLOGY—Oscar E. Tauber, Delma E. Harding and Robert E. Haupt—*Burgess*, 224 p., illus., paper, $3.00. Originally developed for a course in physiology for freshman home economics college students who had had no biology.

MAKING THE YEARS COUNT—Senator Thomas C. Desmond and others—*New York State Joint Legislative Committee on Problems of Aging*, 162 p., illus., paper, single copies free upon request direct to Sen. Desmond, 94 Broadway, Newburgh, N. Y. Leading authorities report on what can be done to provide new facilities and new opportunities to enrich old age.

ON THE DYNAMICS OF WIND-DRIVEN OCEAN CURRENTS—Gerhard Neumann—*New York University Press*, Meteorological Papers, Vol. 2, No. 4, 32 p., illus., paper, $1.50. Currents in the upper layers of the sea are generated and maintained chiefly by the driving forces of the wind.

THE PHYSICAL ANTHROPOLOGY OF IRELAND—Earnest A. Hooten and C. Wesley Dupertuis with a section on THE WEST COAST IRISH FEMALES by Helen Dawson—*Peabody Museum*, Papers Vol. XXX, Nos. 1-2, No. 1, Text, 304 p., No. 2, Tables and Half-Tones, 31 tables, 46 plates, paper, $10.00, cloth $13.00. Report of a complete anthropological survey of Ireland, including excavations designed to cover the whole period of prehistory.

PHYSICAL TECHNIQUES IN BIOLOGICAL RESEARCH Volume 1, Optical Techniques—Gerald Oster and Arthur W. Pollister, Eds.—*Academic* 564 p., illus., $13.50. Experts in individual fields have written of them so that the biologist can tell whether he can apply the technique.

POLIO PIONEERS: The Story of the Fight Against Polio—Dorothy and Philip Sterling—*Doubleday*, 128 p., illus., $2.75. What led up to the Salk vaccine. Beautifully illustrated with photographs by Myron Ehrenberg and the National Foundation for Infantile Paralysis.

PRINCIPLES OF FARM MACHINERY—Roy Bainer, R. A. Kepner and E. L. Barger—*Wiley*, 571 p., illus., $8.75. A textbook for an upper-division course in farm machinery with a strictly engineering approach.

PROFESSOR ABBE . . . AND THE ISOBARS: The Story of America's First Weatherman—Truman Abbe—*Vantage*, 259 p., illus., $3.50. Cleveland Abbe began to make daily weather predictions in 1869. This account of his life was written by his son, who died just before the book went to press.

PRONOUNCE IT CORRECTLY IN FRENCH—Jean-Albert Bede—*Dover*, 33-1/3 RPM long playing record with instruction sheet, 89 cents, With phrase book $1.49. The professor of French at Columbia University pronounces commonly used French words and phrases.

REACTOR HANDBOOK: ENGINEERING—United States Atomic Energy Commission—*McGraw-Hill*, 1075 p., illus., $15.00.

REACTOR HANDBOOK: PHYSICS—United States Atomic Energy Commission—*McGraw-Hill*, 790 p., illus., $12.00. Two of a series of six reference books for the scientist or engineer working with atomic energy.

RESIDUAL GRINDING STRESSES IN HARDENED STEEL—H. R. Letner—*Mellon Institute*, 10 p., illus., paper, free upon request direct to pub-

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VOW LABORATORIES

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lisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Stress gradients close to the surface were found to be quite steep.

SAY IT IN FRENCH—Leon J. Cohen—*Dover*, 128 p., paper, 60 cents, with record $1.49. Helpful for tourists.

SHOP MATHEMATICS—Claude E. Stout—*Wiley*, 282 p., illus., $3.70. Giving the machinist or tool and die maker what he needs to solve practical problems in connection with his work.

SOVIET PROFESSIONAL MANPOWER: Its Education, Training, and Supply—Nicholas De Witt—*Govt. Printing Office*, National Science Foundation, 400 p., illus., paper, $1.25. Reporting a study made under the direction of Dr. M. H. Trytten, Office of Scientific Personnel, National Academy of Sciences. Most of the research was done at Harvard's Russian Research Center. (See p. 342.)

STRUCTURE OF THE EGO: An Anatomic and Physiologic Interpretation of the Psyche Based on the Psychology of Otto Rank—Lovell Langstroth—*Stanford University Press*, 149 p., illus., $4.00. The author concludes that forces of man's will and his conscience have an anatomic representation in the structure of his brain, located in the rear part of the forebrain.

SYMBOLS AND SOCIETY: Fourteenth Symposium of the Conference on Science, Philosophy and Religion—Lyman Bryson, Louis Finkelstein, Hudson Hoagland and R. M. MacIver, Eds.—*Harper*, 611 p., illus., $6.00. Discussing the place of symbols in all aspects of our lives.

TEXTBOOK OF OCCUPATIONAL THERAPY: With Chief Reference to Psychological Medicine—Eamon N. M. O'Sullivan—*Philosophical Library*, 319 p., illus., $10.00. Written primarily for those connected with mental hospitals.

THEORY OF GAMES AS A TOOL FOR THE MORAL PHILOSOPHER—R. B. Braithwaite—*Cambridge University Press*, 76 p., illus., $1.25. The mathematical theory of games is applied to the problem of a jazz trumpeter and a classical pianist, next door neighbors, helping them decide when each should play.

TOWARDS A SCIENCE OF PEACE: Turning Point in Human Destiny—Theo. F. Lentz with foreword by Julian Huxley—*Bookman Associates*, 193 p., $3.00. Mankind does not now possess the knowledge necessary for a speedy and deliberate elimination of the unbearable curse of war, the author concludes, but a redirection of our intellectual resources might quickly produce this knowledge.

200 MILES UP: The Conquest of the Upper Air—J. Gordon Vaeth—*Ronald*, 2d ed., 261 p., illus., $5.00. An account of the whole American program of upper air research, relating this program to its latest development, the artificial satellite.

UNDERSTANDING PEOPLE IN DISTRESS: Emotional and Mental Disorders, Their Cause, Care and Cure—Barney Katz and Louis P. Thorpe—*Ronald*, 357 p., $4.00. What all of us should know about the causes and treatment of mental illness and what is back of minor maladjustments and neuroses.

VARIATION AND GENETIC RELATIONSHIPS IN THE WHITLAVIA AND GYMNOBYTHUS PHACELIAS—George Willson Gillett—*University of California Press*, Publications in Botany, Volume 28, No. 2, 51 p., illus., paper, $1.00. An important part of this study has been the attempted clarification of taxonomic problems.

WORLDS BEYOND THE HORIZON—Joachim G. Leithauser translated from the German by Hugh Merrick—*Knopf*, 412 p., illus., $6.75. An account of great voyages of discovery, from the expedition of the Carthaginian fleet in about 530 B.C. to present plans for a trip into outer space.

Science News Letter, November 26, 1955

An Important "First"

THE HISTORY OF THE TELESCOPE

By Henry C. King

Here is the first book to tell the complete story of the evolution of telescopes from the crude instruments of the ancients, through Galileo's "optick tube" and Newton's first reflector, to the giants of today. Extensive bibliographies, 196 illustrations including 52 optical and instrument diagrams, 456 pages.

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MEDICINE

Advises on Aging, Ailing Truck Driver

➤ AGING TRUCK DRIVERS have it easier and should be able to go on working longer now, thanks to power steering, power brakes and power lifts.

The ailing truck driver, especially if his ailment is either diabetes or a heart attack, should be "grounded," with some exceptions.

Truck drivers as a group show a tendency to be overweight. Since the weight increase is usually accompanied by an increase in blood pressure, they should be encouraged to keep their weight down.

This advice on the "aging, ailing truck driver" was given by Dr. M. N. Newquist of the Texas Company, New York, at a medical and health group session of the American Petroleum Institute meeting in San Francisco.

"Among oil companies which have been in business for a relatively long period of time, the average age of the truck driver is about 39 or 40," Dr. Newquist said.

The 30- to 40-year-old group has the largest number of drivers.

After age 60 the number drops off sharply, with health and safety factors in relation to the job requirements the chief cause.

Emotional stability is as important for safe driving as physical qualification, Dr. Newquist stressed.

"Drivers who are emotionally stable are least susceptible to outside stimuli," he said. "Outside stimuli, whether they are a scrap with the wife, the boss, or anger at a motorist who cut in, lead to mental distraction, the underlying cause of most accidents ascribed to human failure."

In one study it was found that bus drivers selected with the aid of psychological tests designed to screen out the emotionally unstable had fewer accidents than those who did not take such tests.

Science News Letter, November 26, 1955

FORESTRY

Mice Foil Foresters' Reseeding Efforts

➤ A FEW DEER MICE can prevent adequate reforestation following the broadcast seeding of 10,000 Douglas-fir seed per acre, says Donald Spencer, biologist with the Fish and Wildlife Service in Denver, Colo.

Mr. Spencer reviewed the depredations of animal "varmints" on growing tree crops at the Society of American Foresters meeting in Portland, Ore.

Foresters have become alarmed about the rodent problem in establishing a new crop of trees after timber is harvested or fire devastates a forest area, Mr. Spencer said.

Seed that escape rodents and mature into seedlings become prey for other animal pests. Meadow mice and their allies nibble green seedlings like asparagus or chip away at the outer bark, thus girdling the young trees. Rabbits and porcupines attack young trees that escape mice.

Rodent control by baiting is not proving practical. Newly discovered chemical seed treatments which repel animals may give better results. Biologists also hope to find a long-lasting repellent against browsing wildlife that may offer help to young forests.

Science News Letter, November 26, 1955

GOOD NEWS BAD NEWS *ALL THE NEWS* BUT DO YOU NEED IT?

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CARDIOLOGY

President's Specialist Asks Heart Survey Help

➤ HELP in finding out how many other Americans have had heart attacks like President Eisenhower's and how they survived the attack is sought by Dr. Paul Dudley White, Boston heart specialist called as consultant in the President's case.

In the *Journal of the American Medical Association* (Nov. 12), Dr. White asks "all the physicians of the country" to send him the following information:

1. The number of patients with unquestionable acute coronary thrombosis in their practices who became ill during the month following the President's attack—Sept. 24 to Oct. 23, 1955, inclusive; the sex, age, occupation and national origin of each patient, and the length of time between onset of illness and any deaths. Dr. White requests that physicians answer even if they had no cases during the period.

2. The number of such cases seen by them who are still alive and who had their heart attack at least three months before the President's, that is, before Saturday, June 25, with details including present work status and occupation.

Dr. White asks the doctors to sign their answers, but says doctors' names will be kept confidential.

"Please answer part 1 anyway and part 2 also if you have time," Dr. White writes, adding that he hopes those who see his letter in the medical journal will pass along the word to others.

Science News Letter, November 26, 1955

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BOTANY

NATURE RAMBLINGS
by Horace Loftin

Mysterious Pumpkin

➤ THERE IS a simple, homey feeling that comes from the sight of a large, orange pumpkin. It conjures up pictures of rich fields at harvest time and laden Thanksgiving tables. It seems far removed from things exotic and mysterious.

Yet, mystery and far away places play a large part in the history of pumpkins and their cousins of the squash family, *Cucurbita*.

Over most of North America, the primitive Indian agriculture was built on three vegetables, almost always grown together in the simply cultivated fields. These three, corn, beans and squash (including pumpkins), seem to have been spread very, very early throughout the continent.

Archaeologists have discovered large quantities of the squash, *Cucurbita ficifolia*, in the oldest deposits of Peruvian coast agriculture, dating before pottery was made there and before corn or true beans were grown there.

The common field pumpkin, *C. pepo*, is prevalent in the cool Mexican highlands where it is a staple food. In Mexico there is not much diversity in the pumpkin, but with its spread northward into the United States, more and more varieties are found.

The great squash of Mexico and the temperate lands is *C. moschata*. From a series of tests to see what species cross with other species, plant scientists think that the moschata squash may be the fundamental agricultural species, domesticated from some wild Mexican types.

Pumpkins are thought to have arisen from the crossing of the moschata squash with another wild squash, probably near the present United States border.

Mystery enters the picture as scientists speculate on the origin of American-like species that are found in the Old World. For instance, archaeological evidence proves that *C. ficifolia* was used very early by man in Peru. Yet this species, growing in a different form and different climate, was first described from specimens taken in India. This squash is used to feed yaks in isolated Tibet. Asiatic forms of *C. pepo* and *C. moschata* also existed to puzzle scientists.

Did the first Americans bring Cucurbita to the New World from Asia? Or did the plants somehow find their way from America to Asia in the days before Columbus?

Science News Letter, November 26, 1955

YOUR HAIR
Its Health, Beauty and Growth
By Herman Goodman, M.D.

A medical specialist tells you what to do to save and beautify your hair, stimulate healthier hair growth, and deal with many problems, as: Dandruff — gray hair — thinning hair — care of the scalp—baldness—abnormal types of hair—excessive oiliness—brittle dryness—hair falling out—infection—parasites—hair hygiene—glands—diet—coloring—and myriad other subjects concerning hair.

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BIOCHEMISTRY

Russian Antibiotic More Active than Penicillin

➤ AN ANTIBIOTIC about ten times as active as penicillin has been produced by the pharmaceutical industry of the Soviet Union, Prof. G. F. Gause of the Academy of Medical Sciences of the U.S.S.R., Moscow, announces in the *British Medical Journal* (Nov. 12).

The new antibiotic is called albomycin. It comes from a new species of streptomycetes, *Actinomyces subtropicus*, which may be distantly related to the soil organisms that produce streptomycin. Albomycin differs chemically from other antibiotics, and contains iron that gives it a bright orange color when in solution.

It has proved effective in treating pneumonia, especially in young children, in the septic complications of dysentery and measles and in meningitis due to penicillin-resistant pneumococci, Prof. Gause reports.

Because it forms a reversible complex with the proteins in blood serum, it circulates readily through the body. It is non-toxic and well tolerated in large doses.

Science News Letter, November 26, 1955

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Questions

ANTHROPOLOGY—How have pottery makers affected the style of monuments? p. 342.

□ □ □

CHEMISTRY—What is the new method used to purify heavy nitrogen of isotope 15? p. 343.

□ □ □

GEOPHYSICS—How has global TV been made possible? p. 342.

□ □ □

MEDICINE—What is myelin? p. 341.

□ □ □

PHYSIOLOGY—What factor probably distinguishes champion athletes from others? p. 344.

□ □ □

PHOTOGRAPHS — Cover, British Information Services; p. 339, University of Notre Dame; p. 343, U. S. Marine Corps; p. 352, Minnesota Mining and Manufacturing Co.

PHILOSOPHY

Ancients Believed In Progress Also

➤ EVIDENCE from ancient scientific writings shows that belief in progress played a decisive role in every period of ancient history, Prof. Ludwig Edelstein of Johns Hopkins University reported at the American Philosophical Society meeting in Philadelphia.

In the Hellenistic era, he said, the law of progress was developed in terms almost identical with those used in modern centuries.

In later Stoicism, the theory of progress became axiomatic in philosophy. Although at the end of antiquity, the progressive tendencies were counteracted by a new concept of science, a little belief in progress was retained even then.

"In short," Prof. Edelstein concluded, "it appears that the ancient and the modern attitudes are not as diametrically opposed as has hitherto been thought."

Science News Letter, November 26, 1955

MINERALS USED IN THE MANUFACTURE OF GLASS, EARTHENWARE CHINA AND FIRE-PROOF BRICKS. 15 specimens 1½ x 2" plus in compartment box 9 x 12". Price $3.00 prepaid.

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NATURAL RESOURCES

Increasing Water Use

Department of Agriculture's 1955 yearbook is devoted to problems of increasing use of decreasing water supply, resulting from population growth and shifts of industry.

➤ A SERIES of blows to the nation's water supply since 1940 has sent experts scurrying out for ways to conserve this diminishing vital resource as well as open up new water supplies.

According to Karl O. Kohler Jr., director of the U. S. Soil Conservation Service's engineering division, the great demands of World War II, unexpected increases in population, shifts in industry, droughts and pollution of streams and lakes have accelerated the need for water, while decreasing the ready supply.

The U.S. population has grown far above normal expectations, he said. In 1940, the projected population for 1975 was 175,000,000 people. Since then, the estimate has had to be revised upward to 200,000,000. Mr. Kohler said water used for human consumption over the U.S. averaged 137 gallons a person daily.

The growing number of people means a growing demand for more agricultural land. It takes an estimated 2.5 acres of cropland to support each individual in the United States.

To find this new acreage, more land is being put under irrigation.

Greatest single use of fresh water in the U.S. is for irrigation, 75 to 100 billion gallons a day, or about one half of the fresh water used here annually.

Next largest water consumer is industry and steam powerplants, Mr. Kohler said, using about 70 billion gallons of fresh water daily, in addition to brackish and salt water used in cooling. A large paper mill uses more water each day than does a city of 50,000 inhabitants, he said.

The rapid industrial expansion since 1938, along with reduced stream flow in drought areas, has increased the growing problem of pollution of streams and rivers, he said.

Seriousness of the pollution problem is becoming more apparent as it discourages industrial expansion in some areas, while threatening numerous municipal water supplies.

A large increase in use of water already available can be made through conservation and reuse. According to Mr. Kohler, present supplies can be extended through:

1. Adoption of laws for controlling the conservation and distribution of surface and ground-water resources for beneficial use.

2. Planning on a river-basin basis for natural resource development where all interrelated water users are included.

3. Reclamation of what today is called waste water.

4. More efficient use of industrial waters.

5. Better land-use practices to control natural precipitation and reduce movement of sediment.

6. More efficient handling of irrigation water to reduce transportation loss and increase efficiency of application.

7. Reduction of evaporation from water surfaces.

New sources of water being investigated and, to a degree utilized, include:

1. Reduction of losses through elimination of unwanted, water-consuming plants.

2. More economical manufacture of fresh water from sea water.

3. "Cloud seeding" for starting or controling precipitation.

4. Additional development of underground and surface water.

Mr. Kohler said that, as shortages appear, less economical water supplies will have to be developed at great cost per unit of water.

His report on water supply problems appears in the U.S. Department of Agriculture yearbook for 1955, "Water," (see p. 348).

Science News Letter, November 26, 1955

TECHNOLOGY

"Diamond Studded" Device Measures Smog

➤ ONE INSTRUMENT being used to solve the smog riddle is a balloon-borne, "diamond-studded" device that etches meteorological data on a smoked glass plate.

Developed by Don T. Hilleary, University of California at Los Angeles meteorologist, the device is known as a meteorograph.

It was brought into the smog picture by the Air Pollution Foundation. Three such instruments will be used by the Los Angeles County Air Pollution Control District to probe the inversion layer, the layer of hot air over cold air that periodically clamps a lid on pollutants in the Los Angeles basin, trapping smog.

Heart of the instrument, which is designed to be attached to a captive balloon, is a tiny railway car. The car, drawn by a clock mechanism, moves along at a quarter of an inch an hour. The smoked glass plate is carried by the car and thus data is plotted on it against time.

Three mechanisms register temperature, pressure and humidity. A recording arm with a diamond point is attached to each mechanism and etches responses on the smoked glass plate.

The instrument is a foot long, weighs about a pound and has its own tiny air conditioning system to ventilate the temperature mechanism.

Science News Letter, November 26, 1955

New Machines and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 806. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

PIPETTE CONTROL DEVICE designed for use with radioactive and other dangerous solutions adds a two-foot extension for laboratory work. The pipette never has to be touched. The device features replaceable parts where contamination may occur.

Science News Letter, November 26, 1955

KITCHEN FILE for the busy housewif has built-in easel for hands-off reading. With both hands occupied, the woman-about-the-house can still read recipes or instructions. The clear plastic case is 6-5/16 inches wide, 8 inches high and holds 200 extra-large file cards.

Science News Letter, November 26, 1955

SUN SHADING SLATS replace lenses in sunglasses. Made from a light plastic, the louver-like slats snap into frames. Slats can be interchanged to harmonize with different color combinations in clothing.

Science News Letter, November 26, 1955

REFLECTIVE LIQUID makes traffic hazards and obstructions brightly visible to nighttime motorists, as shown in the photograph. Designed for application to wood, concrete and other rough surfaces, the liquid can be either sprayed or painted. Good for a year, it is available in a four-pound pail or enough for 140 square feet of area.

Science News Letter, November 26, 1955

GARAGE DOOR DECORATIONS can be applied by the do-it-yourself enthusiast with ready-made stencils. Available in four different designs, the silhouettes can be made any color desired.

Science News Letter, November 26, 1955

WINDOW WASHER permits cleaning without getting your hands wet. A small bottle is filled with water and three drops of a detergent. Suds are wiped on with a self-feeding sponge, the washer is reversed, and the suds taken off with a squeegee. The washer is seven and one-half inches long and made of plastic.

Science News Letter, November 26, 1955

CELLOPHANE TAPE DISPENSER permits tape application without wrinkles, waste or touch of fingers. The plastic dispenser has a light metal guide. In operation, the tape is set down on the surface to be sealed, drawn along and cut cleanly with the metal guide edge.

Science News Letter, November 26, 1955

AUTOMATIC WATCHDOG for owners of yachts, motor launches and small craft sets up a loud warning automatically whenever the engine oil pressure or temperature misbehave. Installed anywhere aboard ship, the small panel, containing two red lights and a buzzer, is hooked up to the engine.

Science News Letter, November 26, 1955

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11-26-5

Do You Know?

In one auto plant, cumulative error allowed in full length of a *crankshaft* is only 1/30th the diameter of a human hair.

Weather detection *radar* equipment will be installed in the new DC-7C planes used by a British airline.

Glass blowing was practiced by the Phoenicians in the time of Emperor Augustus, 2,000 years ago.

Scientists have grown the virus of *foot-and-mouth disease* in cultures of swine or bovine kidney cells.

The U. S. Super Sabre has flown at an average of 822 miles an hour to gain the world's *speed* record.

Granular-type *insecticides*, which leave much smaller residues on crops than emulsion sprays, hold promise for European corn borer control.